What is claimed is:

1. An isolated polypeptide having the amino acid sequence as given by SEQ ID NO:4, or a unique portion thereof.

2. The isolated polypeptide of claim 1, wherein the unique portion is selected from the group consisting of an amino acid sequence given by SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8 and SEQ ID NO:9.

3. An isolated polypeptide having an amino acid sequence encoded by the DNA isolate consisting essentially of a nucleotide sequence that encodes an amino acid sequence differing in at least one amino acid from the amino acid sequence of human *erb*B-3, or a unique portion thereof, and having greater overall similarity to the amino acid sequence of human *erb*B-3 than to that of any other polypeptide.

4. A purified antibody specific for a unique portion of SEQ ID NO:4 or $gp180^{erbB-3}$.

5. The antibody of claim 4, wherein the unique portion is selected from the group consisting of an amino acid sequence given by SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8 and SEQ ID NO:9.

6. The antibody of claim 4, wherein the antibody is conjugated to a therapeutic drug.

7. The antibody of claim 4, wherein the antibody is labeled with a detectable moiety.

8. The antibody of claim 4, wherein the antibody is bound to a solid support.

9. A bioassay for determining the amount of *erb*B-3 mRNA in a biological sample comprising the steps of:

a) contacting the biological sample with a nucleic acid isolate consisting essentially of a nucleotide sequence that encodes *erb*B-3 or a unique portion thereof under conditions such that a hybrid molecule can be formed; and

b) determining the amount of hybrid molecule present, the amount of hybrid molecule indicating the amount of *erb*B-3 mRNA in the sample.

10. A bioassay for screening potential analogs of ligands of *erb*B-3 receptors for the ability to affect an activity mediated by the *erb*B-3 receptors, comprising the steps of:

a) contacting a molecule suspected of being a ligand with *erb*B-3 receptors produced by a cell that yields functional *erb*B-3 receptors;

b) determining the amount of a biological activity mediated by the *erb*B-3 receptors; and

c) selecting those analogs which affect the biological activity mediated by the *erb*B-3 receptor.

11. A bioassay for determining the amount of an *erb*B-3 antigen in a biological sample comprising the steps of:

a) contacting the sample with an antibody according to claim 4 under conditions such that a specific complex of the antibody and the antigen can be formed; and

b) determining the amount of the antibody present as the complex, the amount of the complex indicating the amount of *erb*B-3 antigen in the biological sample.

12. A method for targeting a therapeutic drug to cells having high levels of *erb*B-3 receptors, comprising the steps of:

a) conjugating an antibody according to according to claim 4 or an active fragment thereof to the drug; and

b) administering the resulting conjugate to an individual with cells having high levels of *erb*B-3 receptors in an effective amount and by an effective route such that the antibody is able to bind to the receptor on the cells.

13. A method for detecting the presence of an *erb*B-3 activating ligand in a source containing a potential *erb*B-3 ligand, comprising the steps of:

a) contacting a first sample of cells from a cell line that expresses *erb*B-3 protein with the source containing a potential *erb*B-3 ligand for a time and under conditions sufficient to allow *erb*B-3 ligand contained in the source to bind to *erb*B-3 protein to form a triggered sample, wherein the cell line expresses *erb*B-3 protein having low level intrinsic tyrosine phosphorylation;

b) contacting a second sample of cells from the cell line with a control medium for the time and under the conditions as given in step a) to form a control sample;

c) determining the level of *erb*B-3 activation in the triggered sample and in the control sample; and

d) comparing the level of *erb*B-3 activation in the triggered sample with the level of *erb*B-3 activation in the control sample, wherein an increase in activation in the triggered sample over the control sample indicates the presence of an *erb*B-3 activating ligand in the source containing a potential *erb*B-3 ligand.

14. The method of claim 13, wherein the determining step comprises measuring the level of *erb*B-3 intrinsic tyrosine phosphorylation in the triggered sample and in the control sample, wherein an increase in the level of *erb*B-3 intrinsic tyrosine phosphorylation correlates with an increase in the level of *erb*B-3 activation.

15. The method of claim 13, wherein the determining step comprises measuring the level of cell growth in the triggered sample and in the control sample, wherein an increase in the level of cell growth correlates with an increase in the level of *erb*B-3 activation.

16. The method of claim 13, wherein the determining step comprises measuring the level of DNA synthesis for the cells in the triggered sample and in the control sample, wherein an increase in the level of DNA synthesis for the cells correlates with an increase in the level of *erb*B-3 activation.

17. The method of claim 13, wherein *erb*B-3 is overexpressed by the cell line.

18. The method of claim 13, further comprising the step of purifying the *erb*B-3 activating ligand.

19. A method for detecting the presence of an *erb*B-3 blocking ligand in a source containing a potential *erb*B-3 ligand, comprising the steps of:

a) contacting a first sample of a cell line that expresses *erb*B-3 protein with the source containing a potential *erb*B-3 ligand for a time and under conditions sufficient to allow *erb*B-3 ligand contained in the source to bind to *erb*B-3 protein to form a blocked sample, wherein the cell line expresses *erb*B-3 protein having high level intrinsic tyrosine phosphorylation;

b) contacting a second sample of the cell line with a control medium for the time and under the conditions as given in step a) to form a control sample;

c) determining the level of *erb*B-3 activation in the blocked sample and in the control sample; and

d) comparing the level of *erb*B-3 activation in the blocked sample with the level of *erb*B-3 activation in the control sample, wherein a decrease in activation in the blocked sample over the control sample indicates the presence of an *erb*B-3 blocking ligand in the source containing a potential *erb*B-3 ligand.

20. The method of claim 19, wherein the determining step comprises measuring the level of *erb*B-3 intrinsic tyrosine phosphorylation in the blocked sample and in the control sample, wherein an decrease in the level of *erb*B-3 intrinsic tyrosine phosphorylation correlates with an decrease in the level of *erb*B-3 activation.

21. The method of claim 19, wherein the determining step comprises measuring the level of cell growth in the blocked sample and in the control sample, wherein an decrease in the level of cell growth correlates with an decrease in the level of *erb*B-3 activation.

22. The method of claim 19, wherein the determining step comprises measuring the level of DNA synthesis for the cells in the blocked sample and in the control sample, wherein an decrease in the level of DNA synthesis for the cells correlates with an decrease in the level of *erb*B-3 activation.

23. The method of claim 19, wherein *erb*B-3 is overexpressed by the cell line.

24. The method of claim 19, further comprising the step of purifying the *erb*B-3 blocking ligand.

25. A purified *erb*B-3 activating ligand.

26. A purified *erb*B-3 blocking ligand.

27. A method of decreasing a biochemical or biological activity mediated by the *erb*B-3 receptor, comprising blocking the binding of an *erb*B-3 activating ligand with the *erb*B-3 receptor.

28. The method of claim 27, wherein the blocking is accomplished by an antibody reactive with the ligand binding domain of the *erb*B-3 receptor.

29. The method of claim 27, wherein the blocking is accomplished by an *erb*B-3 blocking ligand.

30. A method of promoting a biochemical or biological activity mediated by the *erb*B-3 receptor, comprising contacting an *erb*B-3 activating ligand with the *erb*B-3 receptor.

31. A method of detecting the overexpression of *erb*B-3 in a sample from a subject, comprising detecting the amount of *erb*B-3 in the sample and comparing the amount in the sample to the amount in an equivalent sample having normal

expression, the presence of *erb*B-3 in a greater amount indicating overexpression of *erb*B-3.

32. The method of claim 31, further comprising correlating the overexpression of *erb*B-3 to a tumor.

33. A method of detecting the activation of *erb*B-3 in a test sample from a subject, comprising detecting the presence of phosphorylation of *erb*B-3, the presence of phosphorylation of *erb*B-3 indicating the presence of *erb*B-3 activation in the sample.

34. The method of claim 33, further comprising comparing the amount of *erb*B-3 phosphorylation in the test sample to the amount of *erb*B-3 phosphorylation in a sample from a normal subject and correlating an increase in phosphorylation in the test sample, with the presence of a neoplastic condition in the subject.